CLAIMS:

1. A method of manufacturing a semiconductor device comprising the steps of:

growing a semiconductor layer structure having at least an active region, a cladding region, and a saturable absorbing layer disposed within the cladding region; and

subsequently modifying the band-gap energy of one or more selected areas of the saturable absorbing layer.

2. A method as claimed in claim 1 and comprising increasing the band-gap energy of the one or more selected areas of the saturable absorbing layer.

3. A method as claimed in claim 1 and comprising: growing the saturable absorbing layer with a band-gap energy that is smaller than the band-gap energy of the active region; and increasing the band-gap energy of the one or more selected areas of the saturable absorbing layer so as to be greater than the band-gap energy of the active region.

4. A method as claimed in claim 1 wherein the one or more selected areas of the saturable absorbing layer comprises substantially the entire area of the saturable absorbing layer.

5. A method as claimed in claim 1 wherein the step of modifying the band-gap energy of the saturable absorbing layer comprises creating vacancies near a surface of the device.

6. A method as claimed in claim 5 and comprising creating the vacancies near a surface of the device on the opposite side of the saturable absorbing layer to the active layer.

7. A method as claimed in claim 5 and comprising plasma irradiation of the surface of the device thereby to create vacancies near a surface of the device.

8. A method as claimed in claim 7 and comprising disposing a dielectric layer over the surface of the device before the plasma irradiation.

9. A method as claimed in claim 8 wherein the dielectric layer is a silicon dioxide (SiO_2) layer or a silicon nitride layer.

10. A method as claimed in claim 6 and comprising the step of heating the device thereby to migrate the vacancies into the saturable absorbing layer.

11. A method as claimed in claim 10 wherein the saturable absorbing layer is a quantum well layer.

12. A method as claimed in claim 1 wherein the band-gap energy of the active region is unaltered or is substantially unaltered by the step of modifying the band-gap energy of the one or more selected areas of the saturable absorbing layer.

13. A device produced by a method as defined in claim 1.

14. A device as claimed in claim 13 and comprising a semiconductor laser device.

15. A device as claimed in claim 14 and comprising a stripe ridge laser.

16. A semiconductor device comprising an active region; a cladding region; and a saturable absorbing layer disposed within the cladding region; wherein the saturable absorbing layer comprises one portion that is absorbing for light emitted by the active region and comprises another portion that is not absorbing for light emitted by the active region.

17. A device as claimed in claim 16 and wherein the saturable absorbing layer comprises a plurality of absorbing portions, each absorbing portion being absorbing for light emitted by the active region.

18. A device as claimed in claim 16 wherein the saturable absorbing layer further comprises a plurality of non-absorbing portions that are each not absorbing for light emitted by the active region.

19. A device as claimed in claim 16 wherein the absorbing and non-absorbing portions of the saturable absorbing layer are each substantially stripe-shaped.

20. A device as claimed in claim 16, wherein the device is a semiconductor laser device.

21. A device as claimed in claim 19 wherein the device is a semiconductor laser device and wherein the absorbing and non-absorbing portions of the saturable absorbing layer are crossed with the lasing direction of the laser device.

22. A device as claimed in claim 20 wherein the device is a stripe ridge laser device, and wherein the saturable absorbing layer comprises a first stripe-shaped non-absorbing portion disposed substantially under and substantially parallel to the stripe ridge.

23. A device as claimed in claim 22, wherein the saturable absorbing layer comprises at least a second non-absorbing portion, said second non-absorbing portion of the saturable absorbing layer not being disposed under the stripe ridge.

24. A device as claimed in claim 23 wherein said second non-absorbing portion of the saturable absorbing layer extends substantially parallel to the stripe ridge.

25. A device as claimed in claim 20 wherein at least one absorbing portion of the saturable absorbing layer is coupled to, in use, an optical mode propagating in the laser device.

26. A device as claimed in claim 20 wherein the device is a self-pulsation laser device.